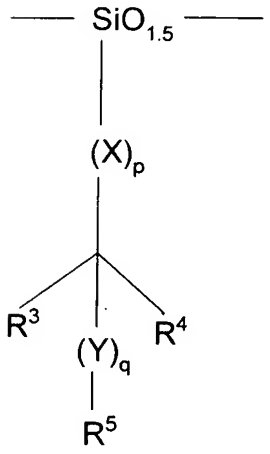
What is claimed is:

1. A resist composition, said composition comprising:

an acid-sensitive imaging polymer; and

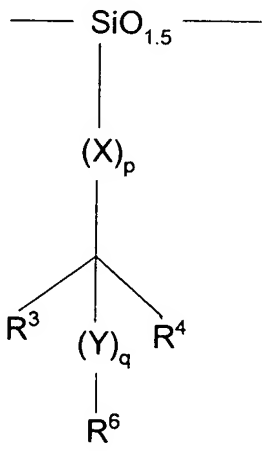
a radiation-sensitive acid generator,

wherein said imaging polymer comprises a silsesquioxane backbone and a solubility inhibiting pendant acid-labile moiety having a low activation energy for acid-catalyzed cleaving, and wherein at least a portion of said imaging polymer is fluorinated resist, and wherein said imaging polymer comprises a combination of monomeric units (II) and (III), (III) and (IV) or units (II) and (V), wherein the monomeric units (II) and (III) are described by the formulas:




(II)

and




(III)

in which

each $R^3$ is independently selected from the group consisting of a hydrogen atom, a halogen atom, a linear alkyl, a branched alkyl, a fluorinated linear alkyl, a fluorinated branched alkyl, a fluorocycloalkyl, a fluoroaryl, or any combination thereof,

each X is independently selected from the group consisting of an oxygen atom, a sulfur atom, $NR^3$, a linear alkyl, a branched alkyl, a fluorinated linear alkyl, a fluorinated branched alkyl, a fluorocycloalkyl, or a fluoroaryl, wherein p is an integer having the value 1 or 0,

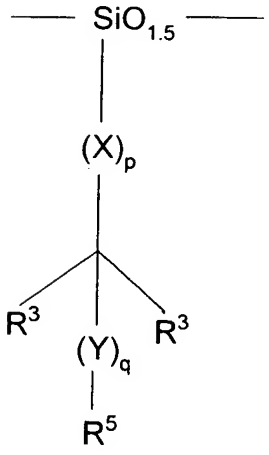
each Y is independently selected from the group consisting of a linear alkyl, a branched alkyl, a fluorinated linear alkyl, a fluorinated branched alkyl, a fluorocycloalkyl, or a fluoroaryl, wherein q is an integer having the value 1 or 0,

each $R^4$ is independently selected from the group consisting of a fluorine atom, a fluorinated linear alkyl, fluorinated branched alkyl, a fluorocycloalkyl, a fluoroaryl, or any combination thereof,

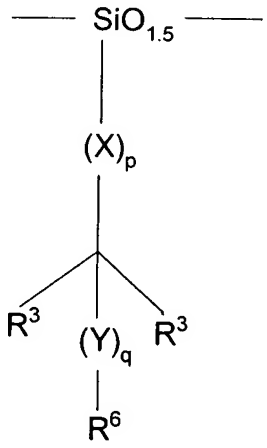
each $R^5$ is independently a solubility inhibiting group, and

each $R^6$ is independently a solubility promoting group; and

the monomeric units (IV) and (V) are described by the formulas:




(IV) and




(V).

2. The resist composition of claim 1, wherein said imaging polymer further comprises a pendant solubility promoting moiety.

3. The resist composition of claim 2, wherein said pendant solubility promoting moiety is selected from the group consisting of a hydroxyl, a fluoroalcohol, a carboxylic acid, an amino group, an imino group, a fluorinated imino group and a fluorinated amino group.

4. The resist composition of claim 1, wherein said solubility inhibiting pendant acid-labile moiety is selected from the group consisting of an acetal, a ketal, an orthoester and fluorinated versions thereof.

5. The resist composition of claim 1, wherein at least a portion of said solubility inhibiting pendant acid-labile moiety is fluorinated.

6. The resist composition of claim 2, wherein at least a portion of said solubility promoting moiety is fluorinated.

7. The resist composition of claim 1, wherein said silsesquioxane polymer has a weight average molecular weight of about 800 to 500,000.

8. A method of forming a structure on a substrate, said method comprising:

(a) providing a substrate;

(b) applying the resist composition of claim 1 to said substrate to form a resist layer on said substrate resist;

(c) patternwise exposing said substrate to radiation, whereby acid is generated by said radiation-sensitive acid generator in exposed regions of said resist layer;

(d) removing patternwise soluble portions of said resist layer to form a pattern of spaces in said resist layer; and

(e) transferring said pattern of spaces to said substrate.

9. The method of claim 8, further comprising the step of baking the exposed resist layer to promote acid-catalyzed reaction in exposed portions of said resist layer subsequent to said step (c) of patternwise exposing.

10. The method of claim 8, wherein said polymer further comprises a pendant solubility promoting moiety.

11. The method of claim 10, wherein said pendant solubility promoting moiety is selected from the group consisting of a hydroxyl, a fluoroalcohol, a carboxylic acid, an amino group, an imino group, a fluorinated imino group and a fluorinated amino group.

12. The method of claim 8, wherein said solubility inhibiting pendant acid-labile moiety is selected from the group consisting of an acetal, a ketal, an orthoester and fluorinated versions thereof.

13. The method of claim 8, wherein said solubility inhibiting pendant acid-labile moiety is selected from the group consisting of an acetal, a ketal, an orthoester and fluorinated versions thereof.

14. The method of claim 8, wherein at least a portion of said solubility inhibiting pendant acid-labile moiety is fluorinated.

15. The method of claim 10, wherein at least a portion of said solubility promoting moiety is fluorinated.

16. The method of claim 8, wherein said silsesquioxane polymer has a weight average molecular weight of about 800 to 500,000.

17. The method of claim 8, further comprising forming a planarizing layer over said substrate, and wherein said resist layer is applied directly to said planarizing layer.

18. The method of claim 17, wherein said planarizing layer has a underlayer composition comprising:

(A) a polymer containing (i) cyclic ether moieties, (ii) saturated polycyclic moieties, and (iii) aromatic moieties if said underlayer composition does not require a separate crosslinker, or

(B) a polymer containing (i) saturated polycyclic moieties, and (ii) aromatic moieties if said underlayer composition requires a separate crosslinker.

19. The method of claim 18, wherein said underlayer composition further comprises a fluorinated polycyclic moiety, a fluorinated aromatic moiety or a combination thereof.

20. The method of claim 8, wherein said step of transferring further comprises a method selected from the group consisting of depositing, implanting and etching.